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GUATEMALA MOLLUSCA.

BY A. A. HINKLEY.

This list is the result of three vacation trips. For the determinations I am indebted to Dr. H. A. Pilsbry, Dr. Bryant Walker, Dr. V. Sterki, Dr. Wm. H. Dall and others of the National Museum and Prof. F. C. Baker of the Illinois University.

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Lake Amatitlan is some 20 miles south of Guatemala City; it is two lakes connected by a short strait across which the railroad embankment has been built. Laguna Station is on the south or southwest of the lake, just across the strait.

Pachycheilus lacustris (Morelet) is plentiful in the shallow water of the lake. The largest were found among rushes some 40 feet from a hot spring. Egg masses of this mollusk were numerous, much like those of *Physa* but larger. The fresh masses were clear, changing to yellowish as the young were about to emerge. Some were seen breaking through.

Amnicola guatemalensis Walker. Taken near the edge of the water or on driftwood and pumice. Another species of *Amnicola* was taken with the above.

Potamopyrgus coronatus (Pfeiffer). Taken from a muddy bottom in a sheltered place near a building. Many are smooth with a dark line in place of the row of spines.

Across the lake from Laguna were a number of dried-up pools on the railroad right-of-way, which contained dead specimens of the following species:

Succinea recisa (Morelet).

Aplexa fuliginea (Morelet).

Aplexa tappanensis guatemalensis (Crosse & Fischer).

Planorbis orbiculus (Morelet).

Planorbis cultratus (D'Orbigny).

Planorbis sp.?

Planorbula obstructa (Morelet) var. *anodonta* (Pilsbry).

Soon after passing out of the east gate of Guatemala City, the road descends into a deep ravine with a creek at the bottom; here the only species was *Aplexa fuliginea* (Morelet); it was also taken in the basins of fountains in the city.

Out of the north gate the road is bordered by a row of large cedar trees on either side for a half-mile or more, to a cedar grove, then to the edge of a deep ravine where the road-bed is cut out of the high, irregular, precipitous slope until a much lower level is reached, and the road soon ends at the tapia baths. Farther down the canyon can be seen the reservoir. In the cedar grove were found:

Drymæus alternans (Beck).

Drymæus jonasi (Pfr.).

Helicina sp.? One specimen.

Pachycheilus largillierti (Philippi). Immature specimens were very numerous in the large pool, the individual rooms and the stream. The only mature specimen found was dead and bleached. From the reservoir were taken:

Pseudosuccinea championi (Von Martens). One specimen only.

Aplexa fuliginea (Morelet).

Physa sp. Varies from smooth to costate forms.

Planorbis caribæus Orb.

Segmentina obstructa (Morelet), var. *anodonta* (Pilsbry).

Gundlachia hinkleyi Walker.

Lævapex excentricus (Morelet).

Amnicola cisternina (Walker).

Amnicola hinkleyi (Walker).

Potamopyrgus coronatus (Pfr.).

Pisidium sp.? "They appear to be of the same group with a Pisidium from Chili, that is closely related to *Pisidium sterkianum* from Uruguay; same shape and appearance, but somewhat smaller."

Pseudohyalina maya Pils.

Thysanophora dioscoricola (C. B. Adams)? One poor specimen taken from the washings when collecting the Amnicola.

Maya Farm, Quirigua, a short distance from the Farm Overseer's quarters, are the interesting "Quirigua Ruins", a good description of which appeared in the *National Geographic Magazine* some years ago. On this farm were found:

Aperostoma dysoni (Pfeiffer).

Helicina amoena Pfeiffer. Under and about decaying vegetation.

Helicina flavida Mke. or *trossula* (Morel. The identity of the original *H. flavida* seems to be in doubt.

Thysanophora plagioptycha (Shutt.). One specimen.

Oxystyla princeps (Brod.). Two live ones taken from banana plants; dead ones scarce.

Gastrocopta pentodon (Say). Under chips, scarce.

Opeas beckianum (Pfr.).

Opeas micra (Orb.). One specimen.

Cæcilioides consobrina veracruzensis (Crosse and Fischer).

Leptinaria guatemalensis Crosse and Fischer.

Euglandina decussata (Desh.). About old logs, under loose bark and other vegetation. A fine species.

Guppya elegantula Pilsbry.

Guppya grundlachi (Pfr.).

Zonitoides minusculus (Binney).

Zonitoides elegantula (Pfr.). Under chips.

Ammoniceras stolli (Martens). Under chips. Only one specimen, rare.

Leptinaria livingstonensis Hinkley.

Streptostyla turgidula (Pfr.) var. *producta* Pilsbry. One specimen.

Succinea recisa Morelet.

Aplexa impluviata laeta Martens. Appeared to be feeding on banana leaves which had been thrown into the pool.

Planorbula obstructa anodonta (Pilsbry). Conchens river.

Laevapex excentricus (Morelet). Pools by the railroad.

Gundlachia hinkleyi Walker. With the above.

Potamopyrgus coronata (Pfr.). Rio Conchens.

Amnicola conchensensis Walker. Rio Conchens.

Ampullaria flagellata lattrei C. & F. On banana leaves and cull bunches of bananas which had been thrown away.

Mycetopoda sp. Rio Conchens. This mollusk burrows head down until the posterior part is just above the bed of the stream; the foot is extended nearly the width of the shell farther down in the soil. When removing the first one found a strong pull tore the foot from the shell.

Nephronaias ortmanni Frierson. Plentiful in Rio Conchens; in one place several hundred were massed together.

Glabaris depexa (Martens). With the above; only one found.

Pisidium guatemalensis (Sterki). Rio Conchens. Sterki says: "Has a hinge of unique formation; width 5, height 4, diam. 3 mm."; fragile.

Pisidium sp. With the above. Sterki says: "Although of the same size and the same appearance, they are evidently distinct from *Pisidium singleyi* (Sterki). Of the same group, same shape and appearance with a *Pisidium* from Barbados; unnamed, so far as I know."

Eupera yucatanensis minima (Pilsbry). Rio Conchens, scarce.

Livingston. Beach and beach drift.

Polygyra helictomphala (Pfr.). Only one specimen.

Streptostyla ligulata (Morelet). "A very rare species"; the only one found was at the edge of vegetation growth.

Helicina flavida (Mke.) or *H. trossula* (Morelet).

Helicina coccinostoma Morelet. First determination was *H. oweniana.*

Helicina sp. More depressed than any other Helicina found except *H. amœna.*

Lucidella lirata (Pfr.).

Truncatella sp. Two specimens.

Cochliopa minor Pilsbry.

Spirula spirula (Linn.). Plentiful in 1914, scarce in 1917.

Thais coronata var. On rocks beyond Cavech village and on piling and breakwater at Puerto Barrios.

Melongena melongena (Linn.). In shallow water. Donax seemed a favorite food for this mollusk.

Strombus pugilis (Linn.). A few dead ones near Cavech village.

Epitonium lineatum (Say). One small specimen.

Cœcum sp. One specimen.

Littorina nebulosa Lam. On rocks and drift logs; common.

Littorina carinata Orb. Young were very numerous on a perpendicular rock; many were beyond reach of the spray from the ordinary waves.

Litiopa melanostoma (Rang).

Nerita fulgurata (Gmel.). Beyond Cavech village, on rocks out of the water at low tide.

Neritina punctulata Lam. In Cavech river on rocks near the limit of high tide. Often these shells were nearly covered with small oval cases (of an insect?).

Neritina listeri Pfr. Close to *N. virginea*, only larger.

Neritina virginea (Linn.). Numerous on the muddy banks of Cavech river, covered with water at high tide, very plentiful on the pebbly beach of Rio Dulce.

Neritina lineata reticulata (C. & F.). In thick swampy woods near the beach.

Neritilia succinea guatemalensis (Pilsbry). Just above high tide in a clear pool of Cavech river; with them were a few young *N. virginea.*

Cylichnella bidentata (Say). Two specimens.

Haminea solitaria (Say). One specimen.

Tagelus poeyi Dall.

Mulinia guadelupensis (Recl.).

Strigilla pisiformis (Linn). Common on the beach, but both valves together were scarce.

Strigilla flexuosa (Say). Much like *S. pisiformis;* has not the red coloring of that species.

Macoma constricta (Brug.).

Donax striata (Linn.).

Donax striata mediamericana (Pilsbry). A small form of *striata.* Dead shells were more numerous than the live ones, or so appeared.

Tivela mactroides (Born). The most common species on the beach; no live ones seen and both valves together were very scarce.

Cyrena solida Phil. Plentiful in Rio Dulce, most mature ones badly eroded.

Cyrenoidea guatemalensis Pilsbry. In 1914 one specimen taken near the mouth of Cavech river.

Mytilus exustus (Linn.). In masses on rocks and drift logs and under the bluff of the projecting point of land, mostly immature.

Mytilopsis sallei (Recluz). Often with *M. exustus.*

Across the Rio Dulce from Livingston, on the first mountain or foothill, is Rio Blanco, a small stream in which were found:

Nephronaias calamitarum (Morelet).

Pachycheilus pyramidalis (Morelet). Mostly immature.

Pachycheilus indiorum (Morelet).

Pachycheilus corvinus (Morelet) and the color variety *lutescens* C. & F.

Helicina rostrata Morelet. On top of the hill one broken, nearly fresh specimen was found. The writer has three specimen received from Thomas Bland many years ago.

A short distance west of Livingston were found:

Aperostoma dysoni (Pfr.).

Amphicyclotus bisinuatus (Martens). Dead specimens.

Chondropoma rubicundum (Morelet). Searee.

Subulina octona (Chem.). Very plentiful by the side of side streets and paths among decaying vegetation and filth; also found on the hillside in front of the hotel, with *Leptinaria livingstonensis.*

Oxystyla princeps (Brod.). Bones only.

Leptinaria livingstonensis (Hinkley). In front of the hotel, on the hillside.

Brachypodella subtilis pulchella (Martens). On stones nearly buried in the soil.

Averellia hinkleyi (Pilsbry). One bone.

Pachycheilus pyramidalis (Morelet). A creek where it is crossed by the telegraph line. A few fossils were taken at this place.

Neritina listeri (Pfr.). Same place as above.

Mountains of Rio Cavech and those back of Cavech village. These are listed together, although there is some distance between. The village is a little farther up the coast than the mouth of the river, the stream having a course oblique with the coast. The mountains or hills of this region are often steeply sloped and covered with thick timber, which keeps down the undergrowth in a great measure, so one can climb without much interference from that source. These limestone hills have many small crevices or openings, affording protection to different kinds of animal life besides mollusks.

Cœlocentrum gigas Martens. More plentiful back of the village than elsewhere. See Nautilus, Vol. 33, page 79.

Cœlocentrum fistula (Morelet). One specimen.

Euglandina decussata (Desh.). None living.

Euglandina monilifera (Pfr.). Bones.

Guppya gundlachi (Pfr.). Scarce.

Averellia hinkleyi (Pilsbry). Only bones.

Leptarionta trigonostoma (Pfr.). Dead specimens and fragments.

Drymæus sulphureus (Pfr.). Dead specimens and fragments.

Streptostyla delibuta (Morelet).

Streptostyla lattrei (Pfr.). Bones; a fine and well-marked species.

Streptostyla schneideri (Strebel).

Streptostyla turgidula producta (Pilsbry).

Opeas beckianum (Pfr.).

Opeas pumilum (Pfr.).

Subulina octona (Chem.). A mile or more back of the village, by a well-traveled path.

Pseudosubulina martensiana Pilsbry.

Leptinaria guatemalensis Crosse and Fischer.

Leptinaria livingstonensis Hinkley.

Spiraxis livingstonensis Pilsbry.

Spiraxis longior Pilsbry.

Brachypodella subtilis pulchella (Martens). Of the same color as the limestone on which they live, they are inconspicuous. The shell hangs parallel with the face of the rock or stands out at an angle.

Bothriopupa breviconus Pilsbry. One specimen.

Cæcilioides consobrina veracruzensis (C. & F.).

Helicina amoena Pfr.

Helicina flavida Mke. or *H. trossula* Morelet.

Helicina coccinostoma Morelet.

Cistula radiosum (Morelet). Found on limestone and dead wood, sometimes hanging by a thread. Some were in motion, but the larger part were attached to the rock or wood of similar color.

Chondropoma rubicundum (Morelet). Situated above fallen trees, base of rocks and under old banana leaves. Some variation in size.

Pachychilus indiorum (Morelet). Cavech river. This species prefers shallow water. The finest specimens were on a hillside in thick timber where the water spreads out thin over a flat rock surface marked with irregular seams and depressions; many of these mollusks were barely wet, hundreds of the shells with a mottled and polished surface showing through a thin film of water made an attractive sight to any one interested in the beautiful of Nature.

Pachychilus corvinus (Morelet). This mollusk prefers more water than the above. At this locality there is more color variation, from a dark purple to the almost white form known as variety *lutescens*.

Pachychilus largilierti (Philippi). In a small stream, almost dry, they had collected by the thousands, in small pools, many dead and the rest dying. Nearly all were immature. A few of the largest were taken.

PLANTERA, a banana plantation several miles up Rio Dulce from Livingston. For the first few miles the river is picturesque, passing between steep high hills covered with dense vegetation of varying shades of green. Sometimes the slope is broken by an abrupt face of rock. On one such face, larger than the rest, were many obscure figures and markings, in lines of lighter color, said to be drawings of an unknown race of people. The appearance was more like the marks from seepage water carrying lime.

Pachychilus largillierti (Philippi). Only a few specimens found in a small river which was followed for some four miles.

Ampullaria flagellata tristrami C. & F. In a small swamp near the Plantation buildings.

Neritina lineata reticulata (C. & F.). With the above.

Subulina octona (Chem.). A few in the yard under some loose stone.

ESMERALDA. This plantation is on the left bank of Rio Dulce some three miles below the old Fort San Felipe, now in ruins.

Guppya gundlachi (Pfr.). Fragments seen along the trail to Rio Saja.

Opeas micra (Orb.). Under trash in front of a hut.

Opeas pumilum (Pfr.). With the above.

Cæcilioides consobrina veracruzensis (C. & F.). Same as above.

Succinea recisa (Morelet) or *S. guatemalensis.* With above. These are too young to decide to which species they belong with certainty.

Helicina amoena Pfr.

Amphicyclotus bisinuatus (Martens). Two bones.

Ampullaria flagellata tristrami C. & F. On the border of the river among water plants and under drift lodgments.

Pachychilus glaphyrus (Morelet). These are between *immanis* and the *obeliscus* of the lake. Numerous on the border of the river.

Pachychilus pyramidalis (Morelet). Some fine large specimens were found in Rio Saja, under drift and other places protected from the force of the current.

Nephronaias dysoni (Lea). Found with the above. They were always more or less eroded, a good species. This stream is some five miles west of Esmeralda and the above two species were the only ones found there.

Potamopyrgus coronatus nicaraguanus (Ancey). Plentiful in small bays or recesses of the river.

Cochliopa dulcensis Marshall. Common with the other small species taken with a net.

Cochliopa izabal Pilsbry. Common.

Neritina lineata reticulata C. & F.

Neritina listeri Pfr. Both these Neritina were scarce.

Planorbis caloderma Pilsbry. A small species, little larger than *Segmentina obstructa*, with more tumid whorls.

Cyrenoides guatemalensis Pilsbry. One specimen.

Mytilopsis sallei (Recluz). Numerous, on sticks and stones, often in clusters of many individuals.

Jocolo. This plantation, on the north side of Lake Isabal, is owned and operated by Mrs. Potts, a hospitable lady. The commodious residence among palm and citrus trees is picturesque viewed from the small wharf projecting into the lake. The lake is bordered by rushes, with here and there small open beaches of sand. On a point some distance above the wharf was a windrow of fine drift, thrown up by a strong wind; this was the only place where drift was found. It evidently came down a river near by. This proved quite rich in number of species, but specimens were scattering. The entire windrow was worked over. The region has numerous small streams with beds of rock, gravel and sand, with soft mud where they enter the lake.

Nephronaias guatemalanus (von Martens). A few specimens referred to this were found in the lake with *N. ravistellus*. It is some higher and lighter colored than that species.

Nephronaias ravistellus (Morelet). Common. In 1914 they were found mostly in water two to four feet deep, but in 1917 they were plentiful among the rushes and on the sandy beach up to the water's edge.

Nephronaias tabascoensis (Küster). Mrs. Potts gave the writer a few found by a native.

Ampullaria flagellata tristrami C. & F. Marshy places and along the border of the lake, among the rushes on which the white egg-masses were quite numerous a little above the surface of the water.

Ampullaria flagellata lattrei C. & F. On rocks near San Felipe.

Pachychilus glaphyrus immanis (Morelet). Common on the soft mud at the mouth of the streams.

Pachychilus glaphyrus obeliscus (Morelet). The most plentiful *Pachychilus* in the lake. They are more attenuate and smaller than the closely related *immanis.*

Pachychilus lacustris (Morelet). These appear more like a smoother form of *P. obeliscus,* and do not agree with *P. lacustris* from Lake Amatitlan, from which they differ in fewer and flatter whorls, and the suture not as deep.

Pachychilus pyramidalis (Morelet). Plentiful in clear streams, often concealed in lodgments of brush and leaves. On account of its size and clean living it is preferred for food. They are cooked in stews or soups, croquettes, or roasted. The species often reaches three inches in length.

Pachychilus pottsianus n. s. Found only on two hillsides back of Jocolo.

Potamopyrgus coronatus nicaraguanus Ancey. Plentiful; varies from a smooth shell to one with strong striations and prominent spines.

Cochliopa dulcensis Marshall. With the following two species.

Cochliopa hinkleyi Pilsbry. This small flat species of a size that evidently washed through the net in numbers when taking the other small species.

Cochliopa izabal Pilsbry. Common, has some resemblance to *C. guatemalensis.*

Cochliopa izabal Pilsbry, mutation *peristriata* Pilsbry.

Hemisinus ruginosus (Morelet). Common in places on the lake shore. In 1914 one immature specimen was all that was found. In 1917 the first were taken in the net with *Cochliopa,* etc. Later while picking up *Nephronaias* they were noticed among numerous *Pachychilus* and could easily have been passed as the young of that genus. Their trail was made by burrowing instead of crawling on the surface as with other forms.

They burrowed somewhat like a mole, and often the little mole-like ridge could be followed quite a distance, and the mollusk found working under cover.

It is a viviparous genus. When cleaning these shells the embryos run from one to three to the individual. None were noticed with more than three.

Planorbis caloderma Pilsbry. Only three specimens taken in the net with the small forms.

Planorbis caribaeus (Orb). One small specimen with the above.

Ancylus sp. Taken in the net.

Euglandina decussata (Desh.). All dead but one.

Euglandina monilifera (Pfr.). One alive, found in the banana field under dead leaves.

Salasiella guatemalensis Pilsbry. Under leaves and trash.

Guppya elegantula Pilsbry. Lake drift.

Guppya gundlachi Pfr. Lake drift.

Zonitoides minusculus (Binney). Lake drift.

Averellia hinkleyi Pilsbry.

Thysanophora plagioptycha (Shutt.). Lake drift.

Strobilops strebeli guatemalensis n. subsp.

Bulimulus corneus (Sowb.). Found in a banana field under dead leaves.

Drymaeus sulphureus (Pfr.). Bones.

Oxystyla princeps (Brod). Dead.

Opeas beckianum (Pfr.). Lake drift.

Opeas micra (Orb.). Lake drift.

Opeas pumilum (Pfr.). Lake drift.

Subulina octona (Chem.).

Leptinaria guatemalensis C. & F. Lake drift.

Leptinaria livingstonensis Hinkley. In the fields back of Jocolo.

Caecilioides consobrina veracruzensis (C. & F.). Lake drift.

Gastrocopta pentodon (Say). Lake drift.

Succinea recisa Morelet. Banana fields.

Aperostoma dysoni (Pfr.). Under decaying leaves in the banana fields.

Amphicyclotus bisinuatus (Martens). Scarce.

Helicina amoena Pfr.
Helicina tenuis var. *lindoni* Pfr.
Helicina flavida Mke. or *H. trossula* Morelet.
Helicina coccinostoma Morelet.
Lucidella lirata (Pfr.). Lake drift.

Panzos, State of Alta Verapaz. The head of navigation on the Polochic River. No land species found here, although a half day was spent on a stroll up the R. R. to a good-sized creek which was followed for some distance and the return made over the mountain, with no results whatever.

Ampullaria flagellata tristrami C. & F. Two good large specimens, dead, found in a marshy place near the R. R.

Pachychilus pyramidalis (Morelet). Young specimens plentiful in a creek near the town.

Pachychilus indiorum (Morelet). A few specimens taken with the above.

Amnicola panzosensis Walker. From a pool formed by a small stream from a spring or seepage on the mountain side.

Pisidium singleyi Sterki. With the above *Amnicola.*

Chejel, State of Alta Verapaz. At the end of the R. R. the writer was met by a guide and horses sent by Mr. Robert Hempstead, and was conducted to his residence on the Chejel coffee plantation. A nice home on the side of the mountain, some 2000 ft. elevation, with roses, violets and other flowers in the front yard. From the veranda on the other side of the house the mountain side is a steep slope to the base where it meets the base of the next mountain. An extensive mountain view in all directions is seen from this veranda.

Pachychilus indiorum (Morelet). Mr. Hempstead kindly showed me the spring from which we picked up a few specimens of this species. These are lighter-colored and do not show the mottled color of those from the Cavech. This was the only species found at Chejel.

Pachychilus corvinus (Morelet). Immature specimens I took for this species from a rill that crosses the road on the way to Purulha.

Trichodiscina sargi (Crosse & Fischer). One specimen found in a damp, shaded place at the base of a rock bank near the above rill. This appeared to be an ideal place for mollusks, but a half-hour's search produced nothing more.

Drymaeus castus (Pfr.). On the road to Puruhla one fair specimen a little broken and other fragments evidently dropped by birds were all noticed.

Streptostyla nigricans (Pfr.). One immature specimen.

Nothing was found from Puruhla to Tactic.

Tactic. Half way between Pancojchl and Coban.

Pachychilus corvinus (Morelet). Plentiful in two creeks, one north of town and the other in the south edge of the town.

Physa sp. A few quite young noticed in a pool by the road to Coban.

On the road between Coban and Chama.

Euglandina decussata (Desh.). A larger form than those found nearer the coast; dead specimens only.

Pseudosubulina mitescens Martens.

Epirobia polygyrella (Martens). On rock faces exposed to the north.

Eucalodium decollatum (Nyst.). A subspecies. Dr. Pilsbry says "I have never seen this form before." One dead specimen. There were also specimens a little smaller and thinner than the above covered with fine oblique striae extending from suture to suture.

Amphicyclotus boucardi (Pfr.).

Pachychilus graphium (Morelet) var. *transcendens* C. & F. Picked up by the road; probably dropped or thrown aside by some one.

Chama, State of Alta Verapaz. This plantation of coffee, cacao and rubber is in the mountains near Rio Tsalbha and probably half a mile or more from Rio Negro. It is about 900 feet above the sea and the river is 50 ft. lower.

Ampullaria lattrei chamana n. subsp. Four live specimens were brought to the writer by an Indian.

Pachychilus pyramidalis (Morelet). Some distance up Tsalbha River from Chama.

Pachychilus corvinus (Morelet). A few specimens.

Pachychilus hinkleyi Marshall. Many dead ones, but few living. The water was too high to get the living in the swift current.

Pachychilus cinereus (Morelet). Only found in a creek. Probably a peck of these shells were in an old pot saved to burn for lime by Indians. These shells were all more or less mutilated in preparing them to cook.

Physa sp. Two fine specimens taken in a drainage ditch in the Cacao orchard. They have a colored band at different stages of growth as in *P. gyrina*, the transverse striae are irregular, the fine revolving striae are not as distinct as in *P. gyrina*.

Psoronaias kuxensis Frierson. A small stream at Chama, in sheltered places among the rocks on the bed of the stream, many eroded.

Euglandina decussata (Desh.).

Euglandina monilifera (Pfr.). Bluff on the mountain north of Chama.

Streptostyla delibuta (Morelet). Bluff.

Streptostyla lattrei (Pfr.). Bluff.

Streptostyla sargi Crosse & Fischer. Bluff.

Streptostyla sololensis C. & F. Bluff.

Streptostyla turgidula producta Pilsbry. Bluff.

Salasiella sp. Somewhat like *S. hinkleyi*, but the second whorl is much longer; one dead specimen from the bluff.

Salasiella sp. "Cannot refer to any known species" from the bluff.

Ammoniceras stolli (Martens). Three immature specimens in a clearing back of the plantation buildings.

Zonitoides minusculus (Binney). River drift.

Zonitoides elegantula (Pfr.). River drift.

Pseudohyalina puncticipitis Pilsbry. River drift.

Guppya elegantula Pilsbry. River drift.

Guppya gundlachti (Pfr.). River drift.

Lysinoe ghiesbreghti (Pfr.). From the bluff, one very young example.

Drymaeus sulphureus (Pfr.). Bones.

Coelocentrum fistulare (Pfr.). Variety from the bluff north of Chama.

Macroceramus concisus (Morelet). From the bluff.

Opeas beckianum (Pfr.). From the bluff.

Pseudosubulina salvini Martens? Bluff.

Pseudosubulina mitescens Martens. Bluff.

Leptinaria elisae (Tristram). Bluff.

Caecilioides consobrina veracruzensis (C. & F.). River drift.

Gastrocopta pentodon (Say). River drift.

Gastrocopta pellucida (Pfr.). A variety with thickened lip. River drift.

Adelopoma stolli (Martens). One specimen in river drift.

Carychium mexicanum costaricanum Martens. River drift.

Aperostoma dysoni (Pfr.). In cacao grove.

Aperostoma n. sp. On the bluff.

Amphicyclotus boucardi (Pfr.).

Helicina amoena Pfr. Cacao grove.

Helicina coccinostoma Morelet, variety *anozona* Martens. Bluff.

Helicina tenuis Pfr., var. *lindeni* (Pfr.), Bluff.

Helicina fragilis Morelet. Bluff.

Schasicheila hinkleyi Pilsbry. Bluff.

Schasicheila walkeri Hinkley. Bluff.

Eutrochatella nicrodina (Morelet) var. *chryseis* (Tristram). Bluff and drift.

Tomocylus simulacrum (Morelet). Bones scattered in recesses of rocks on the side of the mountain below the bluff.

Chondropoma rubicundum (Morelet). Bluff.

Lucidella lirata (Pfr.). Bluff and river drift.

At the places where the writer has collected different forms of slugs were often noticed. Quite a number were put in alcohol, but only two or three forms of *Vaginulus* came through in good condition.

Descriptions of new species and subspecies.

STROBILOPS STREBELI GUATEMALENSIS, n. subsp.

Shell depressed, light brown, with fine costae which extend over the base and into the small umbilicus; on the base the costae are smaller and crossed by longitudinal microscopical striae. Suture well marked, the first one and half whorls are

smooth. Aperture ovate, wide above, narrow below, peristome reflected and chocolate-colored. Height of shell 1½, width 4⅓ mm.

"This new subspecies differs from the East Mexico *S. strebeli* (Pfr.) by having the periphery more angular; the parietal lamella is more enlarged and prominent at the end, and it has 4¾ whorls, *S. strebeli* having a little over 5. *S. salvini* (Tristram) is a higher shell with wider umbilicus."

Found in beach drift of Lake Izabal near Jocolo.

Types in the Academy coll. and in the writer's coll.

SCHASICHEILA WALKERI n. sp.

Shell globose conic, thin, imperforate, umbilical region depressed; varies from brownish-yellow to a horn color, under the light brown cuticle. Whorls four, convex, crossed by fine irregular lines of growth and revolving microscopical striae which begin on the otherwise smooth nucleus. The costae and striae are visible under a glass on removal of the cuticle. Aperture subcircular, obtusely angular above with a slight, wide sinus at the base; a callus extends from the columella across the parietal wall to a slight notch at the suture. Operculum missing.

Shell measures: height 6, width 6.5 mm. Aperture, length 4, width 2.5 mm.

Found at a bluff on the mountain north of Chamá, Alta Verapaz, Guatemala.

Named in honor of Dr. Bryant Walker, who is doing good work for the advancement of malacology. Type in collection of the Academy of Natural Science, cotypes in coll. B. Walker and the writer.

AMPULLARIA LATTREI CHAMANA n. subsp.

A small, rather solid, short-spired race, with many bands of ecru-olive on a ground of deep colonial buff. The interior chocolate with some light bands above, lip with a broad chamois or pale yellow border without bands.

The aperture is narrower than in *A. lemniscata* Crosse & Fischer, which appears to be nearly related. The surface is not

irregularly pitted as in *A. lattrei*, and the microscopic spiral striæ are more plainly defined.

The embryonic whorls are dark-colored, almost black.

Height 42, breadth 40; aperture, length 33, width 18 mm.

Height 40, breadth 37.5; aperture, length 32, width 20 mm.

Specimens of exactly this form were collected about twenty years ago at "Rio Negro, Chama," by S. L. Schumo, a member of the Philadelphia Academy of Natural Sciences.

Four specimens were brought to the writer by an Indian; one (figured) is in the Academy coll., one in coll. of Mr. Bryant Walker, one in the Museum of the Illinois University, and the writer has the other.

PACHYCHEILUS POTTSIANUS n. sp.

Shell pyramidal, solid, smooth, of a dingy olive color; whorls eight, hardly convex, a light shade below the suture, the last slightly and broadly depressed on the upper part, in front of the aperture the periphery is obtusely angular, the angle diminishes with the growth of the whorl until the last of the body whorl is broadly rounded. Suture shallow, distinct. Aperture ovate, angular above, circular below, chocolate-colored within, parietal callus well defined and much thickened above, labium slightly thickened. Operculum ovate, nucleus depressed. When the mollusk is in its natural position the shell as viewed from above has the appearance of the penult whorl being humped and the under side of the shell is nearly always eroded as if it had been worn away in moving about. Four specimens measure:

Length 44, width 17. Aperture, length 14, width 8 mm.
Length 41, width 17. Aperture, length 14, width 8 mm.
Length 40, width 16. Aperture, length 15, width 7½ mm.
Length 42, width 17. Aperture, length 14, width 8½ mm.

This species was taken from two rills on hillsides, in dense woods. Often there was only enough moisture to keep the shells damp, or they were under fallen leaves; with them where there was a half inch or more of water were *P. pyramidalis*, from which they differ in being smaller and without any sculpturing. They are wider than *P. indiorum* of the same length, and have

not the color markings of that species. They differ from *P. corvinus* by a more solid texture and a smaller and different shaped aperture.

ANSON A. HINKLEY.

BY BRYANT WALKER.

Mr. A. A. Hinkley was born at Farmersville, Indiana, November 26, 1857, and died in Du Bois, Illinois, July 23, 1920. Living for a time at Rockford, Ill., he moved to Du Bois in 1881. The accompanying portrait though executed in earlier years is still an excellent likeness.

Mr. Hinkley was an enthusiastic, energetic, enterprising and most successful collector. I do not know when he first became interested in conchology. His first note on the subject appeared in "The Conchologists' Exchange," the predecessor of the NAUTILUS in 1887. My own correspondence with him began in 1893. He had then already began to specialize on the *Pleuroceridæ*, which continued to be his favorite study all of his life. Prior to that time he had taken two trips to Tennessee and had participated in the results of R. E. Call's expeditions to Alabama and Georgia. In 1894 and again in 1897 he collected in Tennessee and Alabama. He was also one of the contributors of "the sinews of war" to the remarkably successful work of B. H. Wright in developing the Unione fauna of the southern states in the decade prior to 1900.

In 1903 he began the series of collecting trips which have given him a permanent place in the history of American Conchology. In the winter of that year he explored the Coosa and Black Warrior rivers in Alabama. Two remarkable new genera, *Amphigyra* Pils. and *Neoplanorbis* Pils., and many new species of *Somatogyrus*, *Ancylus* and *Quadrula* were discovered. Mr. Hinkley was the first to develop the minute species of Alabama, which had been almost entirely overlooked by the early collectors in that State, whose attention had been wholly absorbed with the wonderful fauna of *Unionidæ* and *Pleuroceridæ* in that region.